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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/559,903	04/26/2000	Zhiping Yin	MI22-1427	1798

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WELLS ST. JOHN P.S.
601 W. FIRST AVENUE, SUITE 1300
SPOKANE, WA 99201

EXAMINER

ECKERT II, GEORGE C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

8m

Office Action Summary	Application No. 09/559,903	Applicant(s) YIN ET AL.	
	Examiner George C. Eckert II	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27, 33 and 36-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27, 33 and 36-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/11/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment dated February 11, 2005 in which claims 39-43 were canceled has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 27, 33 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,133,613 to Yao et al. (of record) in view of applicant's admitted prior art as taught in instant figures 1-3.

Yao et al teach in figure 5 the structure of instant claims 27 and 39. Specifically, Yao et al. teach a polysilicon layer 504 over a semi-conductive substrate 502; a metal silicide 506 on the polysilicon layer; an antireflective layer 508 comprised of SiN_xO_y over and in physical contact with the metal silicide; and a layer of silicon nitride 510 on the antireflective layer. Yao et al. also teach that a photoresist layer 516a is formed on the layers such that the layers may be etched to form a stack (col. 4, lines 37-43).

Yao et al. do not teach that the polysilicon layer is formed on a gate oxide layer or a specific stoichiometry of the antireflective layer. However, these elements are made obvious by applicant's admitted prior art. Regarding the gate oxide layer, applicant teaches in figure 3 a

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gate oxide layer 16 formed underlying the polysilicon layer. Moreover, such a gate oxide layer is well known in the art and considered obvious for inclusion in the teaching of Yao et al. The purpose of the Yao et al. device is to provide better controlled line dimensions during photolithography so that doped regions formed in an underlying substrate, using the lines as masks, are likewise better controlled. It is well known that a MOSFET gate stack, which has an underlying oxide layer, is commonly used as a mask when doping the source/drain regions in a substrate. As such, it is considered obvious to include an oxide layer in the stack of Yao et al.

Regarding the composition of the antireflective layer, applicant teaches that such claimed compositions were known. Specifically, applicant teaches on page 3, lines 12-20 that an antireflective layer 26 may comprise an organic layer or may comprise $\text{Si}_x\text{O}_y\text{N}_z\text{H}$ in the ratios as instantly claimed. Yao et al. teach that the composition of antireflective layer 506 is determined by the required optical properties of the antireflective layer (col. 2, lines 10-16, col. 4, lines 24-36). It is considered obvious to use the ratios taught by applicant's prior art in the device of Yao et al. as such ratios are merely optimizations of ranges known in the art.

Finally, the limitation in claim 27 that the silicide is annealed after formation of the antireflective layer is merely a product by process limitation. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not

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patentable as a product, whether claimed in "product by process" claims or not. Applicant has the burden of proof in such cases, as the above case law makes clear. In the instant claims, the processing limitation does not structurally distinguish over that taught by Yao et al. The final product made obvious by Yao et al. and applicant's prior art as well as the final product instantly claimed, both contain an antireflective layer over, and in direct contact with, a silicide layer. The process of the instant claims has not been shown to provide a structure which is materially different from that made obvious by Yao et al. in view of applicant's prior art.

Response to Arguments

3. Applicant's arguments filed February 11, 2005 have been fully considered but they are not persuasive. Applicant first argues that Yao does not teach a gate stack. However, such limitation was taught by the admitted prior art (APA) and is considered well known in the art as was made clear in the rejection. Applicant further argues that the combination of Yao and the APA must fail because the claim cites that the silicide is annealed after the $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ layer is formed. However, as pointed out in the rejection, this is a processing limitation that does not serve to structurally limit the claim. Moreover, there has been no showing that a structural difference results from the recited process that would distinguish over Yao and the APA. As such, the arguments are not persuasive.

Applicant next argues that the $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ layer taught by the APA cannot be used to reject claim 27 since claim 27 requires the $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ layer be formed over and in physical contact with a metal silicide. However, Yao teaches such a structure. As discussed in the rejection, and acknowledged by applicant (p. 5), Yao teaches that SiON layer 508 is formed over

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and in contact with silicide layer 506. As such, the claimed limitation is taught by Yao and the argument is not persuasive.

Applicant also argues that the layer 508 taught by Yao is not $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ having the specific stoichiometry as claimed. This is conceded as Yao merely teaches that the layer 508 comprises SiN_xO_y but does not provide values for x and y. However, Yao does teach that the SiN_xO_y layer may be formed using various flow rates of the ingredient materials to achieve a range of stoichiometric combinations and thus a range of optical parameters (col. 2, lines 29-44). It is applicant's admitted prior art that teaches an antireflective layer, such as the layer 508 of Yao, may comprise a hydrogenated $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ having the stoichiometry as claimed. As such, because the claimed stoichiometric ranges were known in the art and are merely an optimization of that taught by Yao, the claimed $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ layer is considered obvious. As to the reasonable expectation of success, one skilled in the art would certainly expect success from the combination of Yao and the APA. The Yao reference is merely being optimized by choosing specific flow rates of the underlying materials to achieve an $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$ layer which was known in the art. In all, the arguments are not persuasive.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after


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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Eckert II whose telephone number is (571) 272-1728.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


GEORGE ECKERT
PRIMARY EXAMINER